HD18EXP

Explosion-proof analogue PTZ dome camera with Day/Night

Installation Manual

TKH GROUP SIQURA®

Note: To ensure proper operation, please read this manual thoroughly before using the product and retain the information for future reference.

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HD18EXP
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How to contact us

If you have any comments or queries concerning any aspect related to the product, do not hesitate to contact:

Siqura B.V.
Zuidelijk Halfrond 4
2801 DD Gouda
The Netherlands

General : +31 182 592 333
Fax : +31 182 592 123
E-mail : sales.nl@tkhsecurity.com
WWW : www.siqura.com

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1 About this manual

What this manual covers

This manual describes how to install and connect the HD18EXP, Siqura's explosion-proof, analogue PTZ dome camera with Day/Night. Instructions for configuration and operation of the HD18EXP can be found in the User Manual.

Who should read this manual

This manual is intended for technicians involved in the installation of HD18EXP cameras.

What you should already know

To be able to install and connect the HD18EXP properly, you should have adequate knowledge and skills in the following fields.

- CCTV systems and components
- Electrical wiring and low-voltage electrical connections
- Video, audio, data, and contact closure transmissions
- Hazardous environments and ATEX regulations

Before you start the installation

We advise you to read and observe all instructions and warnings in this manual before you proceed. Retain this manual with the original bill of sale for future reference and warranty service. When you unpack your product, check for missing or damaged items. If any item is missing, or if damage is evident, do not install or operate this product. Contact your supplier for assistance.

Important: The printed manual referenced by DEX-MAN-11-138-A and the printed checklist referenced by DEX-MAN-10-119-A are the governing documents for installation of the HD18EXP. These must be followed to the letter by the installer. For additional installation information, see also the printed Supplementary Installation Information document.

Why specifications may change

At Siqura, we are committed to delivering high-quality products and services. The information given in this manual was current when published. As we are relentlessly working to improve our products and user experience, all specifications are subject to change without notice.

We like to hear from you!

Customer satisfaction is our first priority. We welcome and value your opinion about our products and services. Should you detect errors or inaccuracies in this manual, we would be grateful if you would inform us. We invite you to offer your suggestions and comments via t.writing@tkhsecurity.com. Your feedback helps us to further improve our documentation.

2 Safety and compliance

This chapter contains safety instructions telling you what to do and what not to do when you work with the HD18EXP. It also offers information on product compliance with environmental regulations and explains how to dispose of the product at the end of its service life.

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2.1 Safety requirements

General

The safety information contained in this section, and on other pages of this manual, must be observed whenever this unit is operated, serviced, or repaired. Failure to comply with any precaution, warning, or instruction noted in the manual is in violation of the standards of design, manufacture, and intended use of the module. Siqura assumes no liability for the customer's failure to comply with any of these safety requirements.

Trained personnel

Installation, adjustment, maintenance, and repair of this equipment should conform to all local codes and should be performed by trained and qualified personnel with adequate expertise in hazardous area practice and ATEX requirements. For correct and safe use of the equipment and in order to keep the equipment in a safe condition, it is essential that both operating and servicing personnel follow standard safety procedures in addition to the safety precautions and warnings specified in this manual, and that this unit be installed in locations accessible to trained service personnel only.

2.2 Cautions

Reduce the risk of electric shock

To reduce the risk of electric shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so.

Reduce the risk of ignition of hazardous atmospheres

To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment from the supply circuit before opening. Keep assembly tightly closed when operating. Conduit runs must have a sealing fitting connected within 2 inches of the enclosure.

Warning: TO REDUCE THE RISK OF IGNITION DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE MAY BE PRESENT.

Handle the camera carefully

Do not abuse the camera. Avoid striking, shaking, etc., as the camera can be damaged by improper handling or storage.

Install electrical wiring carefully

Ask a qualified electrician to perform the wiring for the installation. For power specifications, see *Appendix: Technical specifications* of the Installation Manual. Ground the camera appropriately to prevent electric shock or damage. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

Do not disassemble the camera

To prevent electric shock, do not remove screws or covers. There are no user-serviceable parts inside. Consult technical support if a camera is suspected of malfunctioning.

Do not operate the camera beyond the specified temperature, humidity, and power source ratings

Use the camera under conditions where the temperature, humidity, and power source do not exceed the values and ranges given in *Appendix: Technical specifications* of the Installation Manual.

Never face the camera towards the sun

Do not aim the camera at bright objects. Whether the camera is in use or not, never aim it at the sun or other extremely bright objects, as this can damage the camera.

Do not use strong or abrasive detergents

Use a damp cloth to clean the camera when it is dirty. If the dirt is hard to remove, use a mild detergent and wipe gently. To clean the lens, use lens tissue or a cotton tipped applicator and ethanol. *Do no*t clean the lens with strong detergents.

2.3 Regulations

CE	This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions. • This device may not cause harmful interference. • This device must accept any interference received, including interference that may cause undesired operation.
	This symbol on the product or on its packaging indicates that this product shall not be treated as household waste in accordance with Directive 2002/96/EC. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By proper waste handling of this product you ensure that it has no negative consequences for the environment and human health, which could otherwise be caused if this product is thrown into the garbage bin. The recycling of materials will help to conserve natural resources. For more information on how to recycle this product, please contact your local city office, your household waste disposal service or the seller of the product.
	Compliance is evidenced by written declaration from our suppliers, assuring that any potential trace contamination levels of restricted substances are below the maximum level set by EU Directive 2002/95/EC, or are exempted due to their application.

3 Product overview

The HD18EXP is a high-speed, explosion-proof, analogue PTZ dome camera which delivers superb performance and durability in extremely harsh and hazardous environments, while reducing the risk of explosion from, for example, electrical and dust ignition. This chapter introduces the HD18EXP and its features.

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3.1 Features

Siqura HD18EXP PTZ Dome

- 1/4" CCD (Super HAD 2 CCD)
- 36x Optical zoom
- 12x Digital zoom
- Preset speed up to 400°/sec
- Preset position / Sequence / Autopan / Cruise
- Multiple PTZ protocols supported
- Digital slow shutter
- Day/Night with IR-cut filter
- Auto white balance
- Wide dynamic range
- Backlight compensation
- 16 Masking zones
- 4 Alarm inputs, 1 alarm output
- Stainless steel housing
- IP67 Ingress Protection
- ATEX Approved for gas and dust

3.2 Models

The HD18EXP series includes models with NTSC (/N) and PAL support (/P).

3.3 Operation requirements

A minimum of one control device is required for operation, such as a control keyboard, a DVR, or a PC. The HD18EXP contains a built-in receiver that decodes commands originating from a control device.

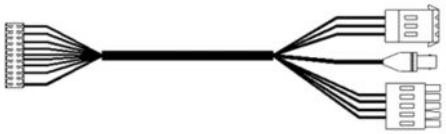
The built-in Pelco D protocol provides connectivity to other surveillance systems and allows the HD18EXP to be integrated with the surveillance systems of other suppliers.

For more information, see Appendix: Technical specifications (on page 20).

3.4 Package contents

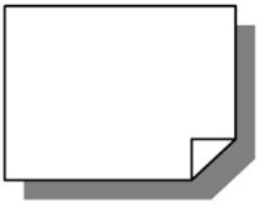
Before you proceed, verify that the box contains the items listed here. If any item is missing or has defects, do not install or operate the product. Contact your supplier for assistance.

Explosion-proof housing with dome body inside



30 cm cable harness for power supply, video, and RS-485

CD containing Installation Manual and User Manual



Printed documentation:
- DEX-MAN-11-138-A
- DEX-MAN-10-119
- Supplementary Installation Information
- EC Declaration of Conformation

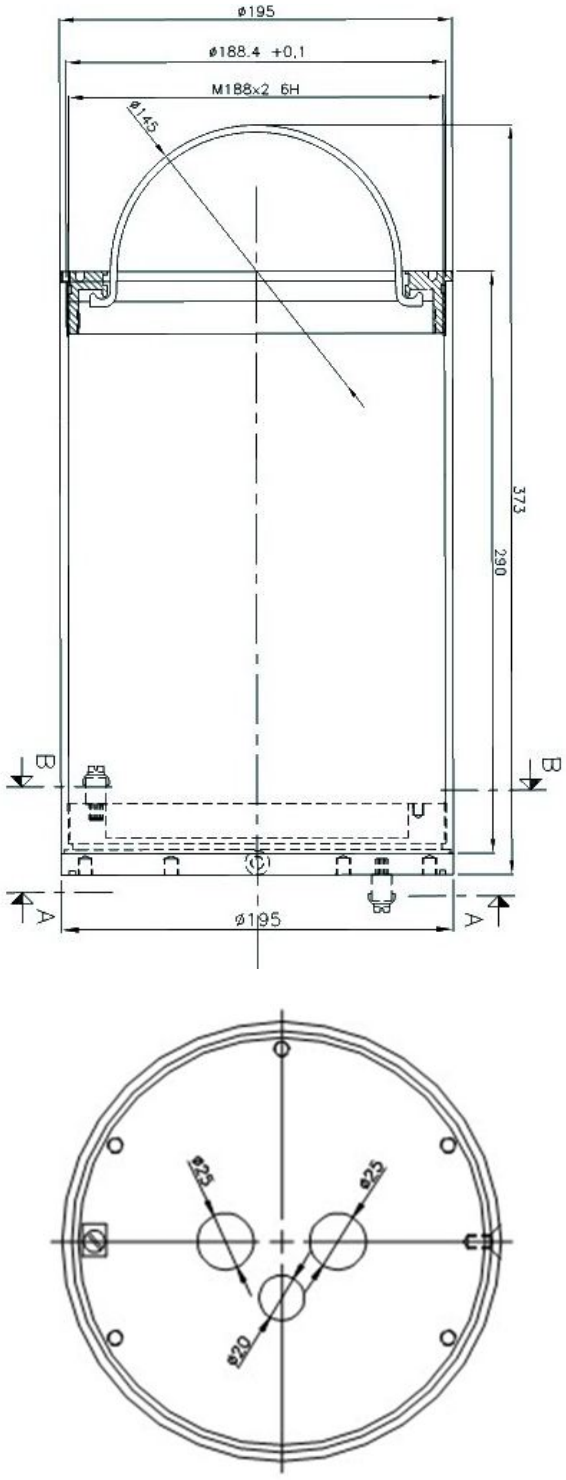
3.5 HD18EXP mounting accessories

The following products are available to mount the HD18EXP camera.

WMEX-01	Wall Mount, Stainless steel, Explosion-proof PTZ
CMEX-01	Ceiling (Pendant) Mount, Stainless steel, Explosion-proof PTZ
PMEX-01	Pole Mount, Stainless steel, Explosion-proof PTZ

3.6 Dimensions

The dimensions of the HD18EXP including its housing are Ø195 x 373 mm (Ø7.7 x 14.7 in.). See the following diagrams for detailed dimensions.



HD18EXP dimensions: side view (top) and base view (bottom)

4 Dome setup and cable connection

This chapter provides illustrations and tables with information about the switch locations and definitions of the HD18EXP.

Note: Mechanical camera installation is described in these printed documents:

- Supplementary Installation Information
- DEX-MAN-11-138-A

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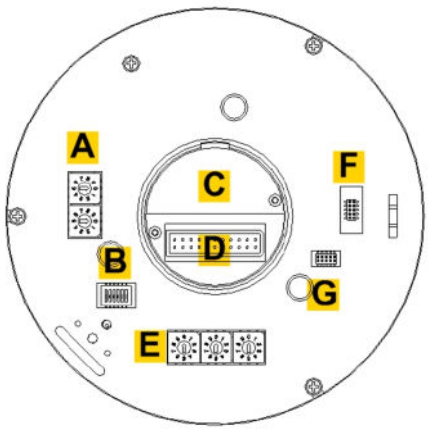
4.1 Switch and connector definition

Before connecting the HD18EXP to other devices of a CCTV system, configure the camera ID and communication switch settings first. These switches are located on the bottom of the dome camera. Additionally, the 22-pin Connector for Data Cable connection and the ISP Connector for firmware upgrade kit connection are located on the back plate of the analogue camera.

The following picture and table describe the various switches and connectors located on the back plate of the dome camera.



Item	Description
A	Communication control protocol switch
B	Communication switch
C	N/A
D	22-Pin connector
E	ID Switch
F	Reserved
G	ISP Connector (for firmware upgrades)

Note: Do *not* change the Communication switch (B) factory-default settings of the camera.

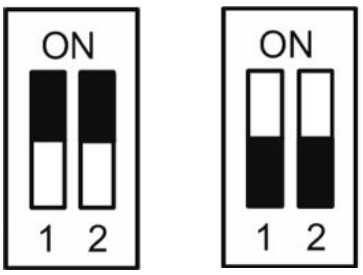
4.2 Communication switch configuration

The following table shows the function of each pin within the Communication switch. You are advised to verify the accuracy of the communication switch configuration.

Communication switch	Switch	Description
	1	RS-485
	2	
	3	Termination
	4	Line lock
	5	System initialisation. Switch 5 is mainly used to restore the factory defaults of the camera.
	6	Camera upgrade. Users must reset switch 6 after firmware upgrades are carried out.

RS-485 is the interface which enables communication between the HD18EXP and its control device. This means that the RS-485 setup of the camera and that of the control device must be the same. The RS-485 default setting is half-duplex, as shown in the figure below. Do not change the default setting without consulting a qualified specialist or supplier.

Half duplex **Full duplex**



RS-485 settings

4.3 ID configuration

If there is more than one camera installed on the same site, it is necessary to define the ID of the camera. Use the dial switches to set the ID of the HD18EXP before you install the camera.

Important: No two cameras should be given the same ID or a communication conflict may occur.

If, for example, the ID of your HD18EXP is 123, the arrow of each dial should point to the respective number, as shown below.

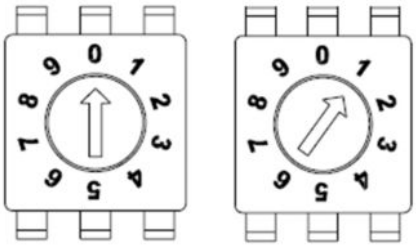
Switch settings for a HD18EXP for which the ID is 123.

Note: The number "0" should be located straight up (as shown above) for correct switch definition.

4.4 Dome control protocol configuration

Depending on the devices in your surveillance system, you need to define the protocol you are going to use so that the devices can communicate with one another. Generally, just one protocol should be used even if the devices on the network are from different manufacturers. Use the dial switch to define the control protocol and baud rate of your HD18EXP.

For example, if you are using the Pelco D protocol, with a switch number of 01, then the baud rate is 2400, and you must set the dials on the control protocol switch to 0 and 1, as shown below.



An example of the control protocol set to Pelco D

Note: The number "0" should be located straight up (as shown above) for correct switch definition.

Refer to the table below to select the appropriate protocol and baud rate.

Switch #	Protocol	Baud Rate
00	VCL	9600
01	Pelco D	2400
02	Pelco P	4800
04	Chiper	9600
05	Phillips	9600
07	DSCP	9600
08	AD422	4800
09	DM P	9600
11	Pelco D	4800
12	Pelco D	9600
13	Pelco P	2400
14	Pelco P	9600
15	JVC	9600
21	Kalatel-485	9600
22	Kalatel-422	4800

4.5 Cable definition and requirements

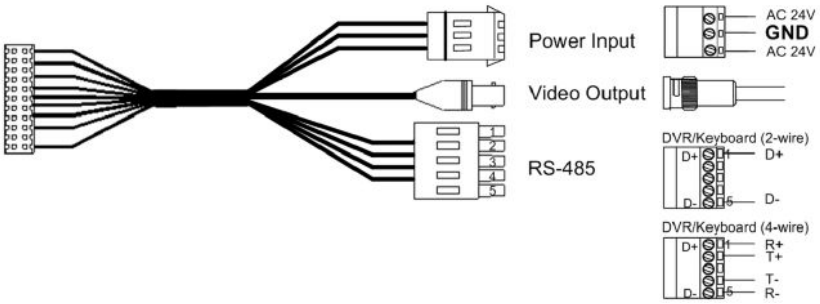
For operation, the HD18EXP camera requires a video and cable harness which includes the following cables.

- **Video**
  The video cable sends video signals to a remote viewing site. Using a coaxial BNC cable to send the video signals is recommended.
- **Power**
  The power cable provides a 24 Vac power supply to the HD18EXP module.
- **RS-485 data**
  The RS-485 cable carries commands from a control device to the camera. A Cat 5 / 24 AWG cable is recommended.
- **Alarm**
  For connecting to alarm devices, such as sensors, sirens, or flashing lights.

Note: Make sure that the power supply corresponds with the power requirement of the camera, or product impairment may ensue. If any mistake occurs, contact a qualified maintenance engineer.

4.6 22-Pin data cable

The cable harness of the HD18EXP includes the following cables.



AC 24 V data cable

Important: Do not use undue strain when pulling the cables during installation. Make sure that the ground wire is inserted into the mid-pin of the terminal block when wiring the power cable and only fasten the cables once they are connected to the camera.

4.7 22-Pin connector definition

With the 22-pin connector, installers can simply connect the power, video, and RS-485 cables to the HD18EXP camera. See the table and figure below for the definition of each pin.

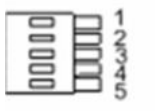
The alarm input and output devices, such as alarm sensors, sirens, or flashing lights, can be easily connected to the alarm pins as necessary. For more information on connecting alarms, see Cable wiring and connection (on page 16).

Pin	Definition	Pin	Definition
1	AC 24-1/DC (+)	**12**	ALM-1
2	ALM NC	**13**	ALM-2
3	AC 24-2/DC (–)	**14**	ALM-3
4	ALM NO	**15**	ALM-4
5	FG	**16**	ALM-5
6	ALM COM	**17**	ALM-6
7	T+	**18**	ALM-7
8	R-	**19**	ALM-8
9	T-	**20**	ALM GND
10	R+	**21**	VGND
11	ISOG	**22**	Video

4.8 RS-485 connector definition

RS-485 is the interface that allows the HD18EXP camera to communicate with its control device. The recommended cables for the RS-485 communication are Cat 5 cables. The maximum cable length for 24 AWG wire is 4000 feet (1219 metres). If the total cable length exceeds 4000 feet, use a repeater to maintain the signals.

The camera and control keyboard are connected with a terminal block. See the figure and table below for pin definition and wiring.



RS-485 connector

Pin	Corresponding pin(s) on the 22-pin connector	Definition
1	7, 10	T+, R+, (D+)
2-4	Reserved	
5	8, 9	T-, R-, (D-)

4.9 Cable wiring and connection

Users may need to do cable wiring in the following instances.

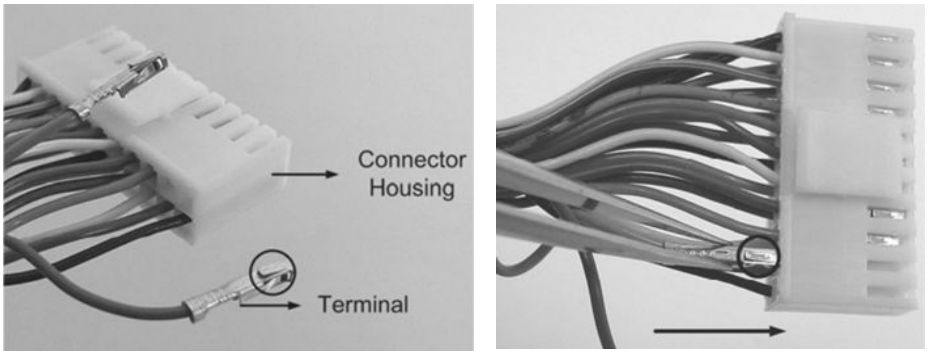
- Connecting self-provided cords to the connector housing instead of using the equipped data cable
- Connecting alarm input and output devices

See 22-Pin connector definition (on page 15) for the exact position of each cord.

To wire a connection

1 Insert the terminal pin into the pin holes on the connector housing.
Make sure that the hook is facing outwards, as shown in the figure.

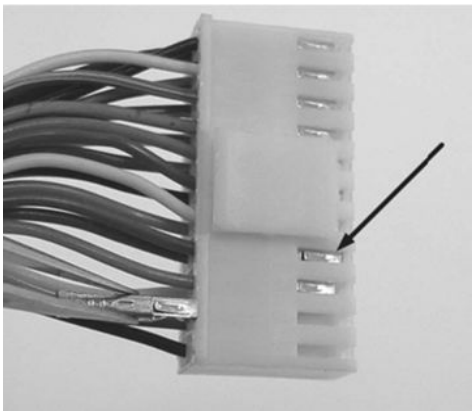
2 Connect the 22-pin connector to its mating port on the HD18EXP camera.



Inserting a terminal into the connector

To unlock the terminal

- Press the hook with an appropriate tool and pull it out gently.



Removing a terminal from the connector

5 Use a control keyboard

The HD18EXP camera can be integrated into the surveillance systems of other suppliers using one of the many built-in protocols. For an overview of which protocols are available for use with the HD18EXP, see the section entitled Dome control protocol configuration (on page 13). This chapter describes how to integrate a Pelco keyboard.

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5.1 Baud rate

The default baud rate of the HD18EXP is set to 9600.Make sure that your control keyboard uses a compatible baud rate.

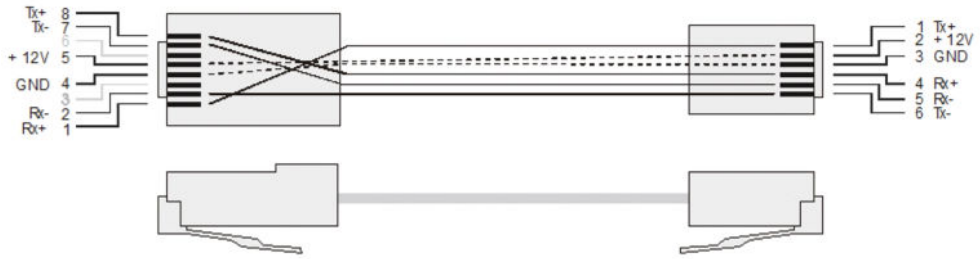
5.2 Functions

Function	Instruction
Set Preset	Number key + press and hold the <Preset> button for three seconds
Go Preset	Number key + <Preset> to command a dome camera to go to a specific preset position
Display or hide an OSD menu	7 7 <Preset>
Move cursor in OSD menu	Move the cursor up/down/right/left by pushing the joystick up/ down/right/left, respectively
<ENTER>	7 7 <Preset>
Reset the dome camera	7 8 <Preset>

5.3 Cable definitions

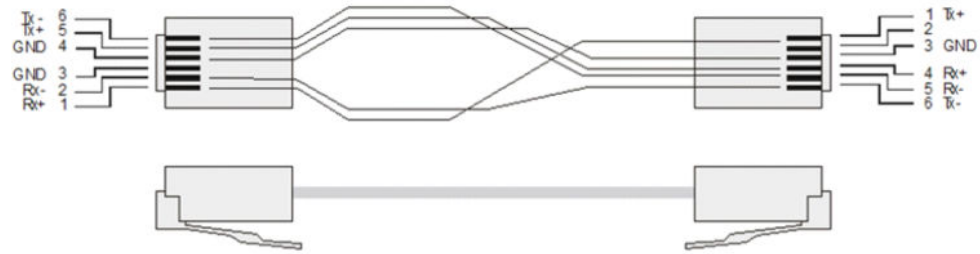
The following diagrams provide an overview of the cable definitions for connecting the HD18EXP camera with a Pelco control keyboard.

Cable definition P protocol keyboard to PTZ camera



For the P protocol keyboard *For the HD18EXP camera*

Cable definition D protocol keyboard to PTZ camera



For the D protocol keyboard *For the HD18EXP camera*

Appendix: Technical specifications

This appendix gives the technical specifications of the HD18EXP series cameras.

Camera	
Image sensor	1/4” CCD (Super HAD 2 CCD)
Image resolution - horizontal	650 TVL
Effective pixels	570 k
Electronic shutter	1~1/10000 s
Signal-to-noise ratio	>50dB (AGC off)
Minimum scene illumination	0.1 lux colour, 0.01 lux (b/w)
Video output	1 Vpp, 75Ω
Angle of view	55.8° wide to 1.55° tele
Focal length	3.4 - 122.4 mm
Focus mode	Auto/manual

Image control	
Wide dynamic range	On/off
Backlight compensation	On/off
White balance	Auto/manual
Iris control	Auto/manual
Automatic gain control	Auto/manual
Day/night (IR-cut filter)	On/off
Digital slow shutter	On/off
Digital zoom	12x
Optical zoom*	36x
Electronic image stabiliser	On/off

**Maximum zoom operation can give optical distortion because of exd polycarbonate bubble.*

Functions	
Privacy masks	16
Directional on-screen display	Compass direction, azimuth, elevation
PTZ coordinate data	Via Pelco D (set/get)

Pan/Tilt	
Pan travel	360° continuous
Tilt travel	10°~190°
Preset speed	400°/s
Manual speed	0.5°~90°/s
Presets	256 presets
Preset accuracy	+/- 0.1°
Cruise	8
Sequence	8
Auto pan	4
Proportional pan and tilt	On/off
Resume after power loss	Yes
Zone title	16
Home function	Preset, sequence, auto pan, cruise
Auto flip	Digital, mechanical, off

Contact closures	
Inputs	8
Outputs	1
Reactions	Preset, sequence, auto pan, cruise

Powering	
Power consumption	20 W (45 W with heater)
Power	24 Vac +/- 20%

Environmental	
Operating temperature (camera)	Continuous -45 °C to +50 °C (-49 °F to +122 °F); 60 °C (140 °F) maximum
Certified temperature (camera)*	Continuous -20 °C to +40 °C (-4 °F to +104 °F)
Ingress protection	IP66, IP67 (IP68 on request)
Certification*	ATEX, II 2 G/D, Exd IIB T5 T100 °C zone 1/21 and 2/22
Entries	1x M20 and 2x M25 (EExd)

**Certifications are site-specific. Consult factory with detailed requirements.*

Mechanical	
Dimensions	Ø195 x 373 mm (Ø7.7 x 14.7 in)
Weight	14 kg (30.9 lbs)
Housing	Stainless steel 316
Bubble	3 mm polycarbonate
Bubble coating	Factory-applied for up to 3 years maintenance-free operation.